



NATIONAL ENERGY TECHNOLOGY LABORATORY

Benefits of Smart Grid Technologies for the Federal Sector

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**IATF Technology Deployment Working Group
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Topics

- **Background of Federal Smart Grid Task Force**
- **Microgrids and Smart Grid**
- **Task**
 - Review of Federal authorizations, financial tools, and building codes relative to their impact on using smart grid to assist in meeting Federal facility energy goals
- **Case studies from Federal agencies**

Federal Smart Grid Task Force



Federal Smart Grid Task Force

Created Under EISA Title XIII, Section 1303

To ensure awareness, coordination, and integration of the diverse smart grid activities in the Federal Government

Functions

- ✓ Serves as Federal focal point on all things “smart grid”
- ✓ Coordinates and integrates inter-governmental activities
- ✓ Oversees report production for submission to Congress
- ✓ Collaborates on interoperability framework
- ✓ Tracks ARRA investments in smart grid
- ✓ Ensures awareness of Federal smart grid activities
- ✓ Collaborates with and supports the NSTC Subcommittee on Smart Grid

Member Organizations

Department of Energy

Federal Energy Regulatory Commission

Department of Commerce

International Trade Administration

National Institute of Standards and
Technology

Environmental Protection Agency

Department of Homeland Security

Department of Agriculture

Department of Defense

Federal Communications Commission

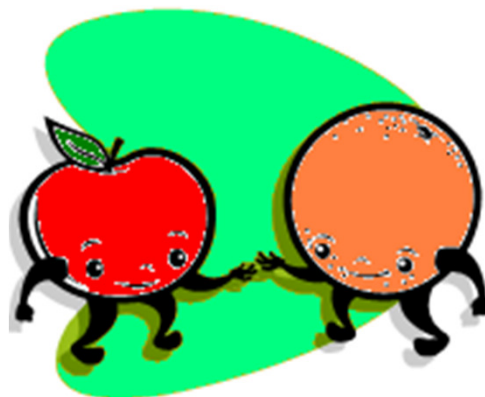
Department of State

National Aeronautics and Space
Administration

National Oceanic and Atmospheric
Administration

NATIONAL ENERGY TECHNOLOGY LABORATORY

Microgrids and Smart Grids



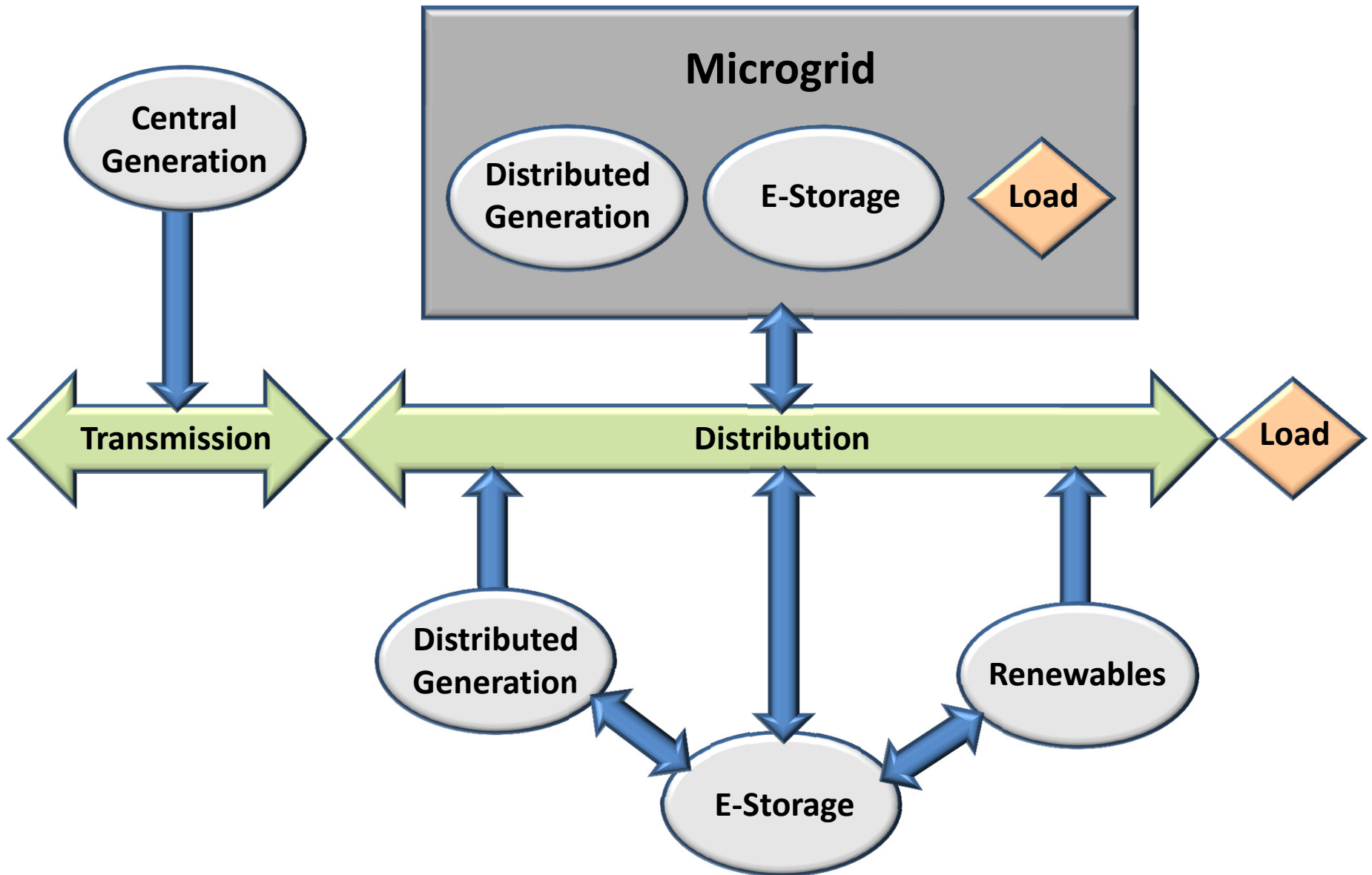
Microgrid

- A microgrid is a group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid. A microgrid can connect and disconnect from the grid to enable it to operate in both grid-connected or island-mode. (*Microgrid Exchange Group*)

Smart Grid

- “Smart grid” generally refers to a class of technology people are using to bring utility electricity delivery systems into the 21st century, using computer-based remote control and automation...made possible by two-way communication technology and computer processing (*US DOE*)

Microgrids & Smart Grids



Context of Smart Grid

Smart Grid	Enhanced by Smart Grid
<p>Two-way communications Sensors Controls Decision support tools Components Transformers Power electronics Conductors</p> <p><i>Sensing, control, automation, power transformation, and communications</i></p>	<p>Renewable energy resources Electric vehicles Energy storage Distributed generation Grid friendly appliances/devices</p> <p><i>Generation, storage, and load</i></p>

Task



Broad Objective

- **Demonstrate Federal leadership in smart grid by:**
 - Deploying smart grid in Federal facilities (e.g., microgrid)
 - Meeting Federal energy goals by using third-party smart grid
 - Sharing experiences
- **In Federal facilities:**
 - Improve energy efficiency
 - Reduce energy usage
 - Reduce energy bills
 - Improve reliability
 - Reduce emissions
 - Increase use clean energy sources (e.g., renewables)
 - Increase use of electric vehicles



Federal Energy Management Goals and Mandates

- **Mandates**

- Energy reduction
- Greenhouse gas emissions



- **Goals**

- Reduce energy use by 30% by 2015 using 2003 as baseline
- Procure 5% of electricity from renewables between 2010-2012
- Procure 7.5% of electricity from renewables after 2012
- Use renewable electricity equivalent to 3% of total electricity use; half must come from renewable sources developed after January 1, 1999

Task Objectives

- **Review Federal “policies” to evaluate their impact on:**
 - Deployment of Smart Grid in Federal facilities (e.g., microgrid, energy management)
 - Contribution of Smart Grid in meeting energy goals of Federal facilities
- **Use of Smart Grid by Federal facility managers**
 - Using smart grid components owned by Federal government
 - Using third-party smart grid components
- **“Policies” include, but are not limited to:**
 - Federal authorities (public laws, executive orders)
 - Third-party financing tools (Energy Savings Performance Contracts)
 - Federal and state building codes and standards
- **Develop case studies**



Review Documents

- Federal authorities
 - public laws, executive orders, directives, *Strategic Sustainability Performance Plan*
- Third-party financing tools
 - energy savings performance contracts (ESPC), purchase power agreements (PPA), enhanced use leases (EUL), utility energy service contracts (UESC) renewable utility energy service contracts (RESPC), state public benefit programs
- Federal and state building codes and standards



Federal Policy Review Scope

Impact of Smart Grid on Federal Facility Energy Goals

- **Identify relevant Federal policies that impact SG**
- **Degree to which policies have been implemented**
- **Impact of policies on SG deployment**
- **Identification of policy gaps**
- **Identification of policy barriers**
- **SG role in meeting Federal facility energy goals**
- **Cases where Government has used third-party SG**
- **Cases where Government has installed SG**
- **Impact of third-party financing (ESCO, PPA, Leases)**
- **Impact of building codes & standards**
- **Findings and recommendations**



Key Outcomes

- **Identify policy gaps and barriers**
- **Identify contribution of smart grid in meeting Federal facility energy goals**
- **Publicize success stories**
- **Demonstrate Federal leadership in smart grid**
- **Share best practices & lessons learned**
- **Recommendations**



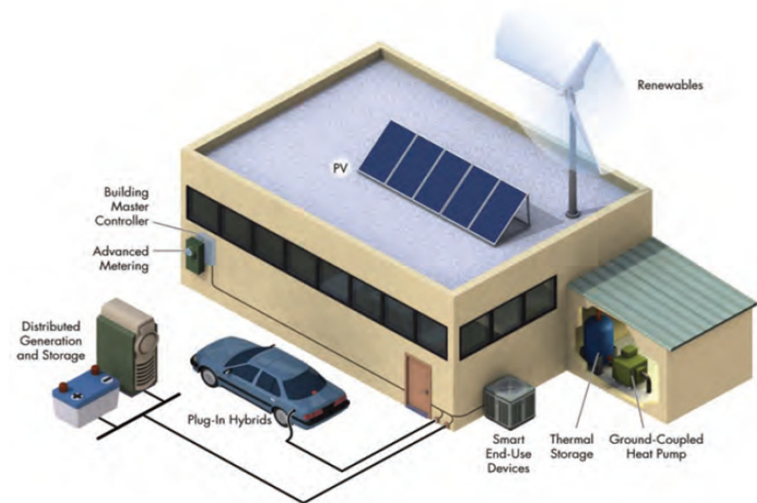
Case Studies



Federal Facility Case Studies

Soliciting examples of:

- Deploying smart grid components in Federal facilities
- Using features of third-party smart grid components
- Thoughts on using smart grid components to meet Federal facility energy goals
 - Gaps
 - Barriers
 - Recommendations



EXTRA SLIDES



Deliverables and Schedule

Firm Deliverables

- Draft and final report
- Presentation

Period of Performance

- 6 months from award date



Federal Government Leadership in Smart Grid Subgroup

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